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## SIGNATURES OF FISSILE MATERIALS: HIGH-ENERGY GAMMA RAYS FOLLOWING FISSION

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The spectral and temporal dependence of beta-delayed gamma rays in the range  $E > 3.0$  MeV from thermal-neutron induced fission are shown to be characteristic signatures of  $^{235}\text{U}$  and  $^{239}\text{Pu}$ . For interrogation of large sea-going cargo containers filled with hydrogenous materials, beta-delayed gamma rays can offer an increase in sensitivity for detection of these materials and other fissile materials by as much as 1000 – 10000 compared to the detection of beta-delayed neutrons.